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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,649	07/02/2003	Joo Sun Yoon	21C-0058	5474

7590
CANTOR COLBURN LLP
55 Griffin Road South
Bloomfield, CT 06002

07/11/2007

EXAMINER

DUONG, THOI V

ART UNIT	PAPER NUMBER
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2871

MAIL DATE	DELIVERY MODE
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07/11/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/612,649

Applicant(s)

YOON ET AL.

Examiner

Thoi V. Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 ~~is/are~~ are pending in the application.
- 4a) Of the above claim(s) 8-13 and 19-23 ~~is/are~~ are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 14-18 ~~is/are~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) *None*
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to the Amendment filed April 17, 2007.

Accordingly, claims 1 and 14 were amended, and claim 24 was cancelled.

Currently, claims 1-23 are pending in this application; of these claims, claims 8-13 and 19-23 were withdrawn and claims 1-7 and 14-18 are considered in this office action.

Response to Arguments

2. Applicant's arguments with respect to the amended claims 1 and 14 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art (Figs. 1-4) in view of Kubo et al. (Kubo, USPN 6,452,654 B2).

Re claim 1, as shown in Figs. 1-4, Applicant's Prior Art discloses a reflective-transmissive type liquid crystal display device, comprising:

a first substrate 11, including:

a thin film transistor 12 disposed on a first transparent substrate 11,

an organic insulation layer 13 disposed on the first transparent substrate 11 to insulate the thin film transistor 12, the organic insulation layer 13 having a contact hole 13a for exposing an output terminal of the thin film transistor (page 3, lines 13-16),

a pixel electrode 14 including a transparent electrode 14a connected to the output terminal 12d of the thin film transistor 12 through the contact hole 13a disposed on the organic insulation layer 13 (page 3, lines 17-24), and a reflective electrode 14b disposed on the transparent electrode 14a, having an area less than the transparent electrode and defining a first region of the transparent electrode 14a (reflective display region), a portion of the transparent electrode 14a being exposed without being covered by the reflective electrode 14b defining a second region 14c (transmissive display region) (page 4, lines 4-10), the second region 14c of the transparent electrode 14a including a first boundary, wherein the first boundary is a boundary between the first and second regions 14b and 14c as shown in Figs. 2-4, and

an orientation film 15 coated on an upper surface of the pixel electrode 14 and having an orientation groove rubbed in a first direction 15a toward the second region 14c (page 4, lines 13-22);

a second substrate 21, including:

a color filter 22 disposed on a second transparent substrate 21 in opposition to the pixel electrode 14, and

a common electrode 23 disposed on an upper surface of the color filter and facing the pixel electrode 14, and

a liquid crystal 30 interposed between the first and second substrates.

Re claim 14, as shown in Fig. 1, Applicant's Prior Art discloses a method for fabricating a reflective-transmissive type liquid crystal display device, the method comprising:

forming a thin film transistor 12 on a first transparent substrate 11,
depositing an organic insulation layer 13 on the first transparent substrate 11 to insulate the thin film transistor 12, the organic insulation layer 13 having a contact hole 13a for exposing an output terminal 12d of the thin film transistor 12 (page 3, lines 13-16),

forming a pixel electrode 14 on the organic insulation layer 13, the pixel electrode 14 including a transparent electrode 14a connected to the output terminal 12d of the thin film transistor 12 through the contact hole 13a (page 3, lines 17-24) and a reflective electrode 14b formed on the transparent electrode 14a, having an area less than the transparent electrode 14a and defining a first region of the transparent electrode 14a (reflective display region), a portion of the transparent electrode 14 being exposed without covering by the reflective electrode 14b defining a second region 14c (transmissive display region) (page 4, lines 4-10), the second region 14c of the transparent electrode 14a including a first boundary, wherein the first boundary is a boundary between the first and second regions 14b and 14c as shown in Figs. 2-4;

coating an orientation film 15 on an upper surface of the pixel electrode 14;
rubbing the orientation film 15 in a first direction 15a toward the second region 14c to form an orientation groove on the orientation film (page 4, lines 13-22).

forming a color filter 22 on a second transparent substrate 21 in opposition to the pixel electrode 14,

forming a common electrode 23 on an upper surface of the color filter 22, the common electrode 23 facing the pixel electrode 14, and

interposing a liquid crystal 30 between the common electrode 23 and the pixel electrode 14 on which the orientation film 15 and the orientation groove are formed.

However, Applicant's Prior Art does not show the second region including a second boundary where the second boundary is an exposed edge of the second region.

As shown in Figs. 2 and 4, Kubo discloses a similar reflective-transmissive type liquid crystal display device comprising a pixel electrode 1 including a transparent electrode 21 and a reflective electrode 23 disposed on the transparent electrode 21, having an area less than that of the transparent electrode and defining a first region 22 (reflective region) of the transparent electrode 21, a portion 20 of the transparent electrode 21 being exposed without being covered by the reflective electrode 23 defining a second region (transmissive region), the second region 20 of the transparent electrode 21 including a first boundary and a second boundary, wherein the first boundary is a boundary between the first region 22 and the second region 20 and the second boundary is an exposed edge of the transparent electrode 21 as shown in the annotated figure 4.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Applicant's Prior Art with the teaching of Kubota by forming a pixel electrode having a second region (transmissive region) including a first boundary and a second boundary, where the first boundary is a boundary between the first and second regions and the second boundary is an exposed edge of the transparent electrode in order to obtain a desired reflectance and transmittance (col. 10, line 57 through col. 11, line 5).

Since Applicant's Prior Art in view of Kubo has the same structure with the instant invention, claimed properties or functions recited in claims 1 and 14 are presumed to be inherent (see MPEP 2112.01); therefore, it is obvious that the orientation groove rubbed in a first direction toward the second region including the first boundary and the second boundary also prevents impurity from being stacked at the first boundary of the transparent electrode.

Re claim 2, as shown in Fig. 4 of Applicant's Prior Art, the first boundary of the transmissive display region 14a and the reflective display region 14b includes at least two vertical straight lines in a layout of the pixel electrode 14,

wherein, re claim 3, the first direction 15a is parallel to two vertical straight lines of the first boundary of the transmissive display region 14a and the reflective display region 14b.

Re claim 5, as shown in Figs. 2-4 of Applicant's Prior Art, the second region 14c exposes two edges of the first region 14b of the transparent electrode 14a, and the two edges, one of the vertical edges and one of the horizontal edges of the first boundary of the second region 14c, are connected to each other,

wherein, re claim 7, the first boundary and the first region each an L-shaped configuration.

Re claim 15, forming a pixel electrode 14 in the method for fabricating a reflective-transmissive type liquid crystal display device of Applicant's Prior Art comprises (page 3, line 17 through page 4, line 10):

Art Unit: 2871

forming the transparent electrode 14a on the first transparent substrate 11 on which the thin film transistor 12 and the organic insulation layer 13 are formed;

forming a metal thin film on an upper surface of the transparent electrode; and

patterning the metal thin film such that the reflective electrode 14b is formed on the first region of the transparent electrode 14a and the first boundary between the first and second regions (boundary of the opening 14c) has a linear shape (squared shape) in a layout of the pixel electrode (Figs. 2-4).

Re claim 17, forming a pixel electrode 14 in the method for fabricating a reflective-transmissive type liquid crystal display device of Applicant's Prior Art comprises (page 3, line 17 through page 4, line 10):

forming the transparent electrode 14a on the first transparent substrate 11 on which the thin film transistor 12 and the organic insulation layer are formed,

forming a metal thin film on an upper surface of the transparent electrode 14a, and

patterning the metal thin film such that the reflective electrode 14b is formed on the first region of the transparent electrode and the second region exposes two edges of the transparent electrode 14a, the two edges, one of the vertical edges and one of the horizontal edges of the boundary of the second region 14c, being connected to each other (Figs. 2-4).

Re claims 4, 6, 16 and 18, as shown in Figs. 8A and 8B of Kubo, the reflective electrode 50 includes a sidewall making contact with the boundary of the reflective and

Art Unit: 2871

transmissive regions (first and second regions), wherein the sidewall is inclined for improving the aperture ratio of the pixel (col. 14, lines 48-55).

Since the structure of the reflective electrode of Kubo is the same as that of the invention, claimed properties or functions are presumed to be inherent (see MPEP 2112.01); therefore, it is obvious that the inclined sidewall also prevents the impurity from being stacked at the boundary of the first and second regions.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-

Art Unit: 2871

2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms, can be reached at (571) 272-1787.

Thoi V. Duong

06/26/2007

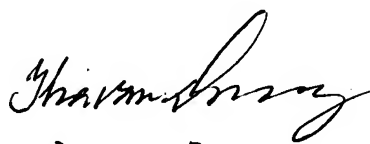

Primary Ex.

FIG. 4

